FIG.1

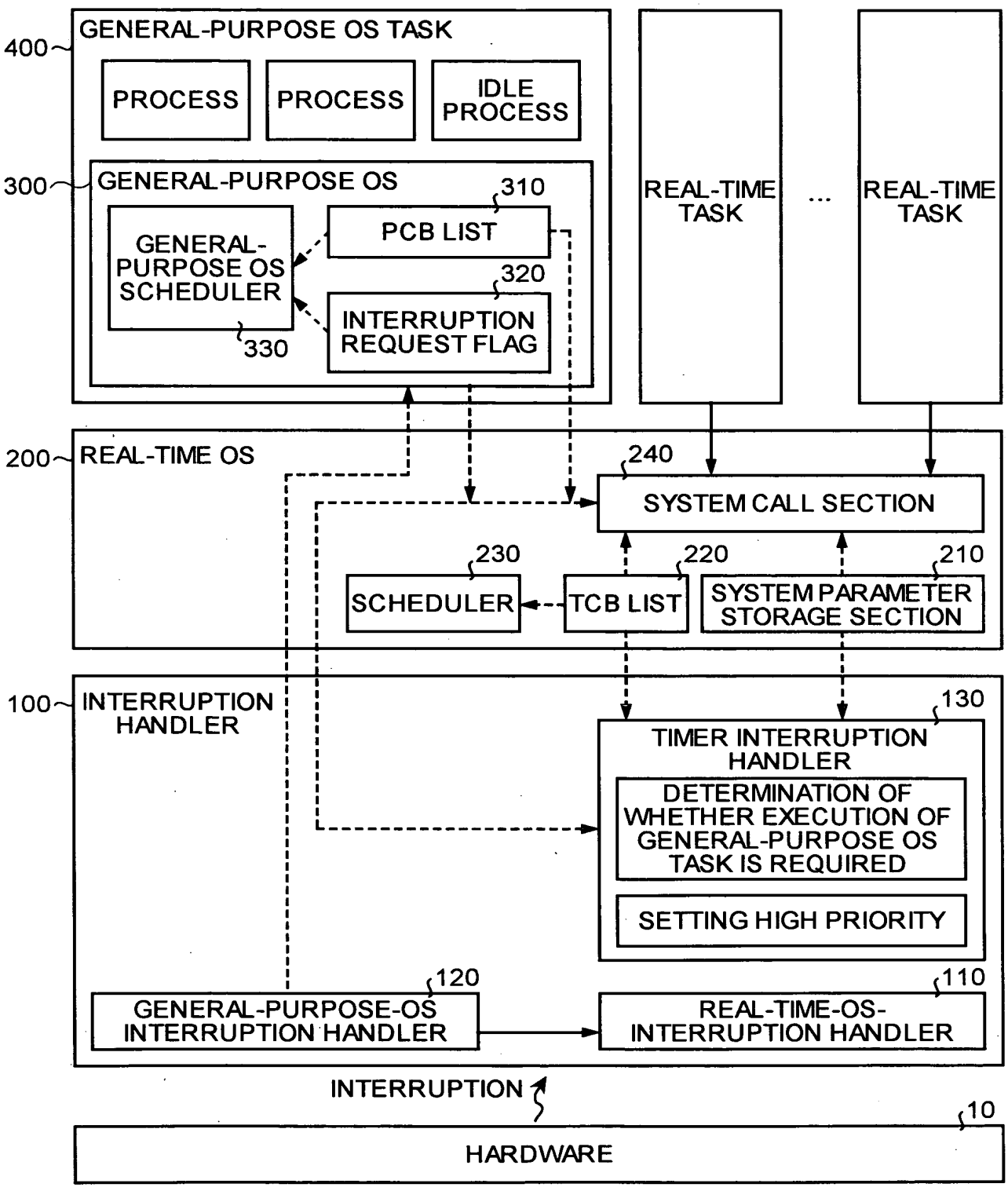

GENERAL-PURPOSE OS TASK
400
PROCESS
PROCESS
IDLE PROCESS
300
GENERAL-PURPOSE OS
310
PCB LIST
320
INTERRUPTION REQUEST FLAG
GENERAL-PURPOSE OS SCHEDULER
330
REAL-TIME TASK
...
REAL-TIME TASK
200
REAL-TIME OS
240
SYSTEM CALL SECTION
230
SCHEDULER
220
TCB LIST
210
SYSTEM PARAMETER STORAGE SECTION
100
INTERRUPTION HANDLER
130
TIMER INTERRUPTION HANDLER
DETERMINATION OF WHETHER EXECUTION OF GENERAL-PURPOSE OS TASK IS REQUIRED
SETTING HIGH PRIORITY
120
GENERAL-PURPOSE-OS INTERRUPTION HANDLER
110
REAL-TIME-OS-INTERRUPTION HANDLER
INTERRUPTION
10
HARDWARE

FIG.2

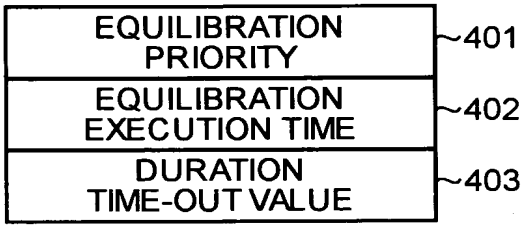

EQUILIBRATION PRIORITY
401
EQUILIBRATION EXECUTION TIME
402
DURATION TIME-OUT VALUE
403

FIG.3

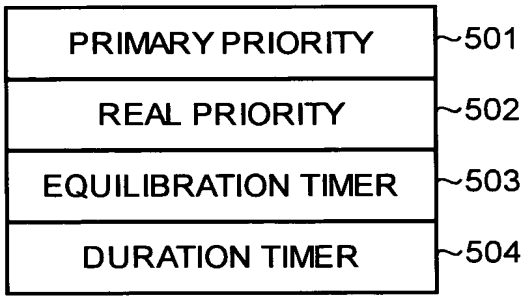

PRIMARY PRIORITY
501
REAL PRIORITY
502
EQUILIBRATION TIMER
503
DURATION TIMER
504

FIG.4

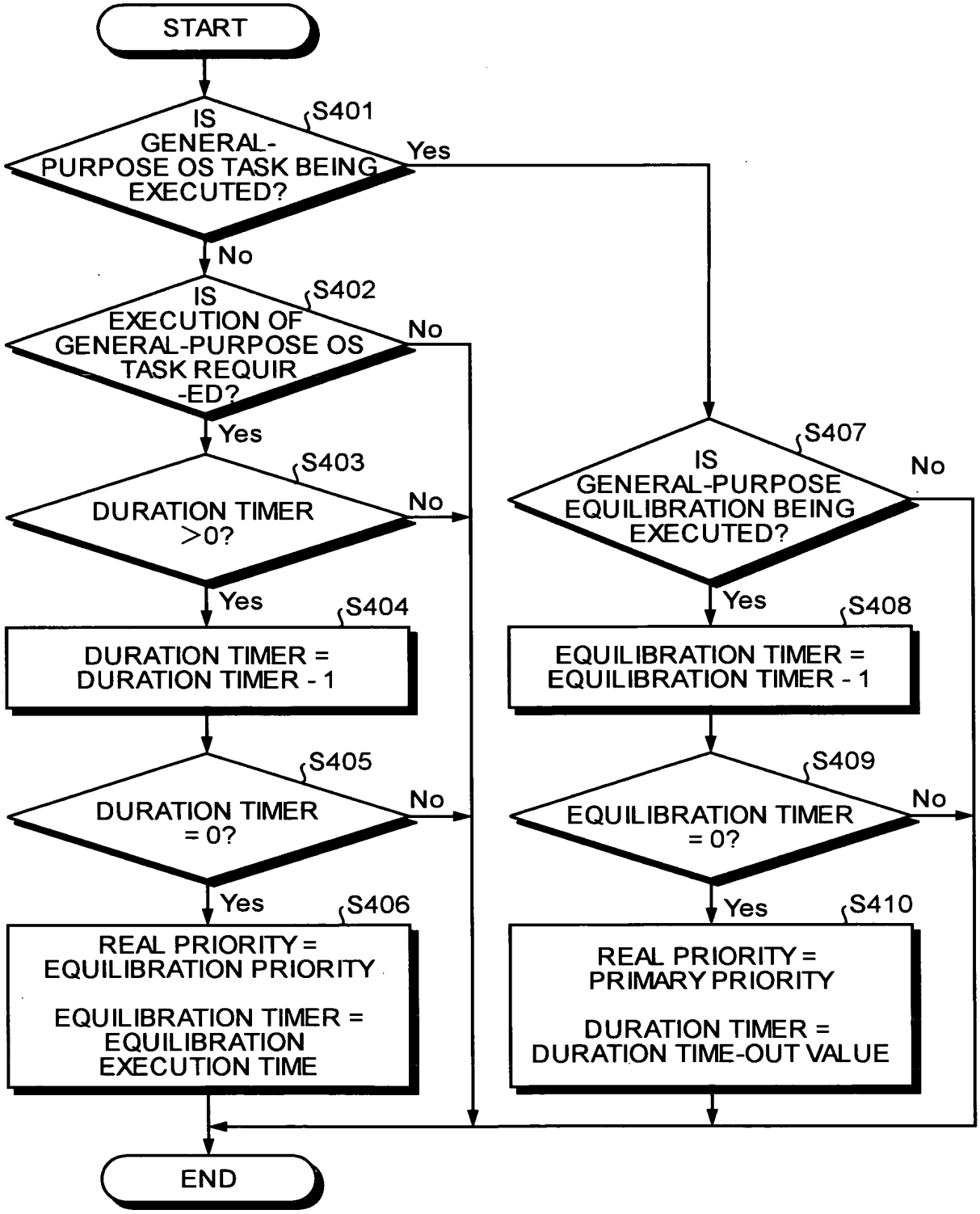

START
S401
IS GENERAL-PURPOSE OS TASK BEING EXECUTED?
Yes
No
S402
IS EXECUTION OF GENERAL-PURPOSE OS TASK REQUIR-ED?
No
Yes
S403
DURATION TIMER >0?
No
Yes
S404
DURATION TIMER = DURATION TIMER - 1
S405
DURATION TIMER = 0?
No
Yes
S406
REAL PRIORITY = EQUILIBRATION PRIORITY
EQUILIBRATION TIMER = EQUILIBRATION EXECUTION TIME
S407
IS GENERAL-PURPOSE EQUILIBRATION BEING EXECUTED?
No
Yes
S408
EQUILIBRATION TIMER = EQUILIBRATION TIMER - 1
S409
EQUILIBRATION TIMER = 0?
No
Yes
S410
REAL PRIORITY = PRIMARY PRIORITY
DURATION TIMER = DURATION TIME-OUT VALUE
END

FIG.5

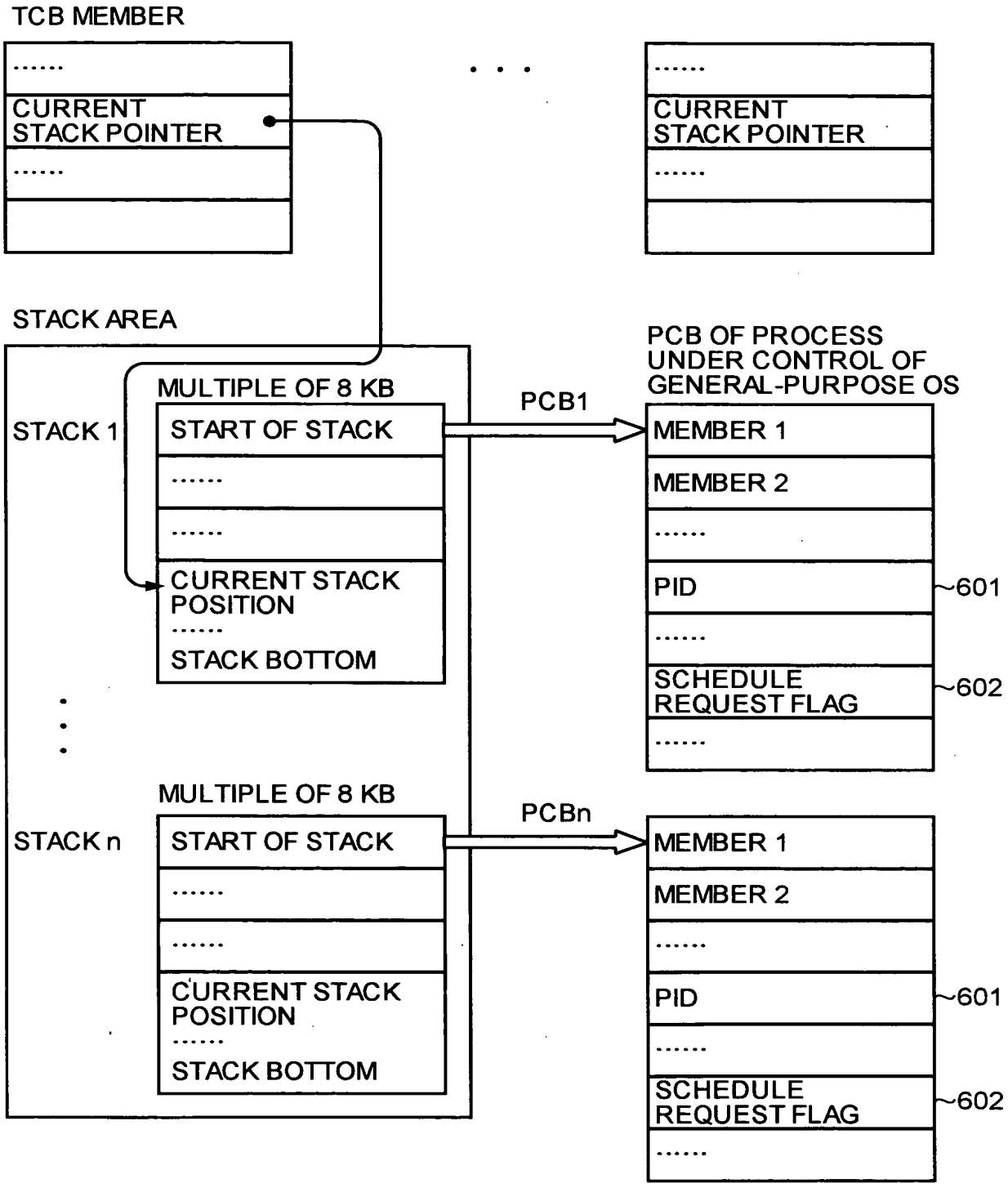

TCB MEMBER
.....
CURRENT STACK POINTER
.....
.....
CURRENT STACK POINTER
.....
STACK AREA
PCB OF PROCESS UNDER CONTROL OF GENERAL-PURPOSE OS
MULTIPLE OF 8 KB
STACK 1
START OF STACK
.....
.....
CURRENT STACK POSITION
.....
STACK BOTTOM
PCB1
MEMBER 1
MEMBER 2
.....
PID
601
.....
SCHEDULE REQUEST FLAG
602
.....
MULTIPLE OF 8 KB
STACK n
START OF STACK
.....
.....
CURRENT STACK POSITION
.....
STACK BOTTOM
PCBn
MEMBER 1
MEMBER 2
.....
PID
601
.....
SCHEDULE REQUEST FLAG
602
.....

FIG.6

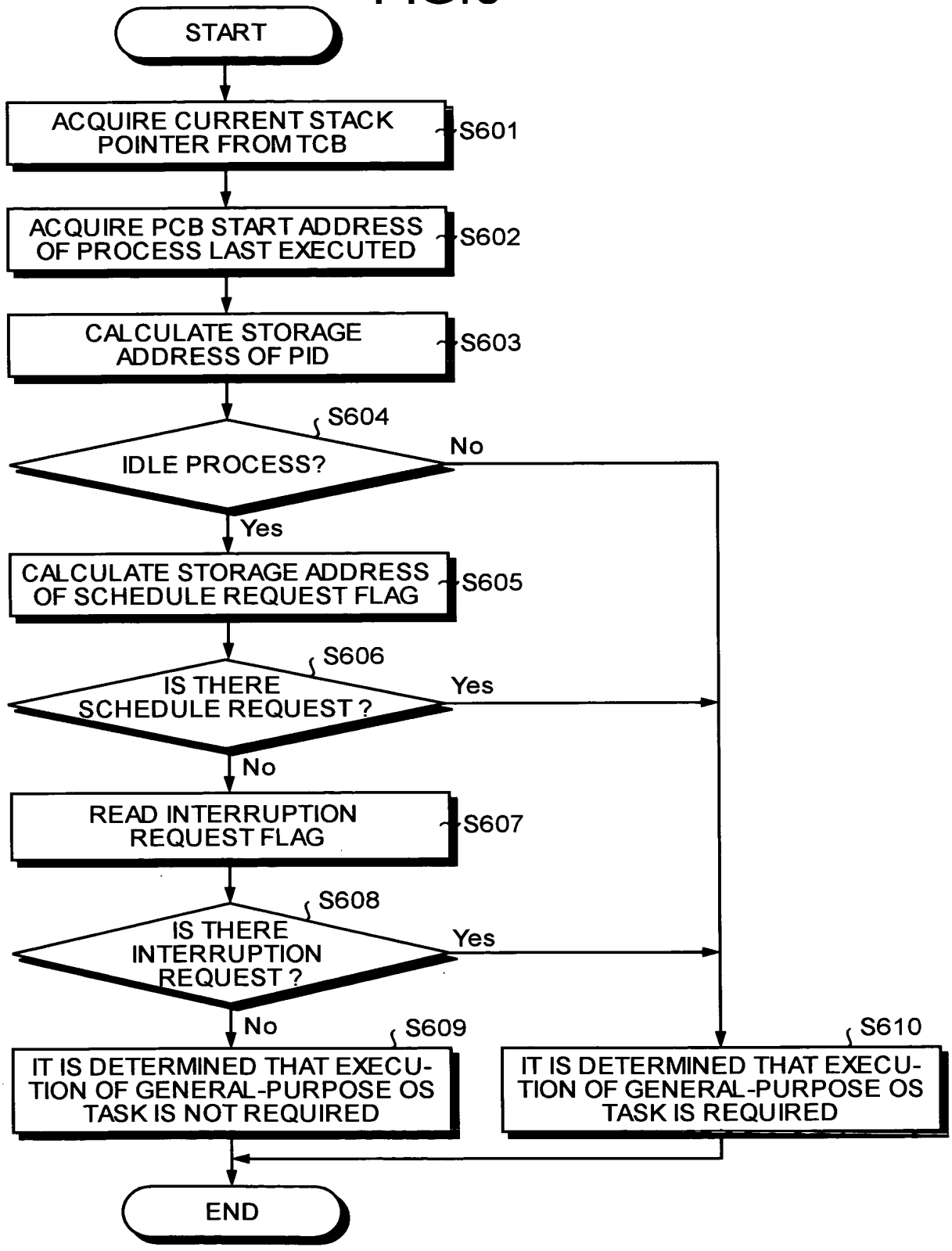

START
ACQUIRE CURRENT STACK POINTER FROM TCB
S601
ACQUIRE PCB START ADDRESS OF PROCESS LAST EXECUTED
S602
CALCULATE STORAGE ADDRESS OF PID
S603
S604
IDLE PROCESS?
No
Yes
CALCULATE STORAGE ADDRESS OF SCHEDULE REQUEST FLAG
S605
S606
IS THERE SCHEDULE REQUEST?
Yes
No
READ INTERRUPTION REQUEST FLAG
S607
S608
IS THERE INTERRUPTION REQUEST?
Yes
No
S609
IT IS DETERMINED THAT EXECUTION OF GENERAL-PURPOSE OS TASK IS NOT REQUIRED
S610
IT IS DETERMINED THAT EXECUTION OF GENERAL-PURPOSE OS TASK IS REQUIRED
END

FIG.7

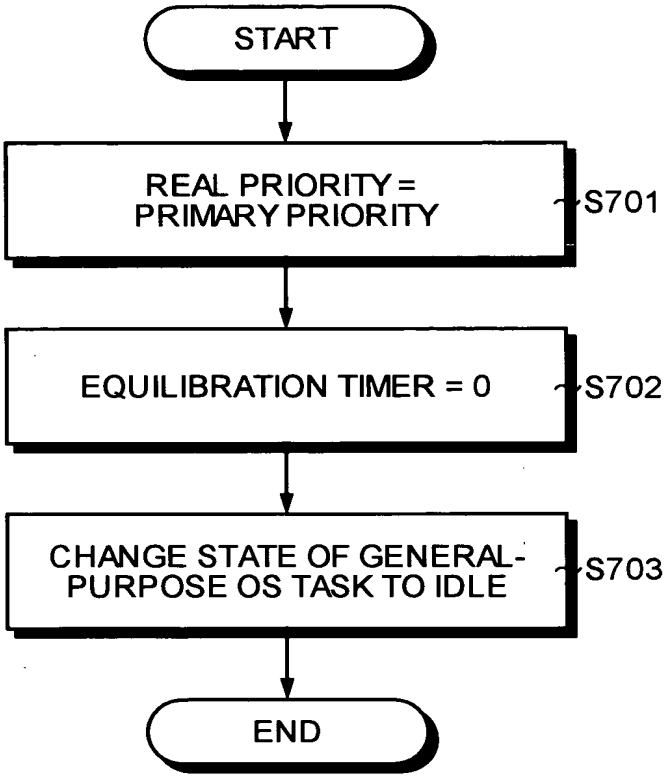

START
REAL PRIORITY = PRIMARY PRIORITY
S701
EQUILIBRATION TIMER = 0
S702
CHANGE STATE OF GENERAL-PURPOSE OS TASK TO IDLE
S703
END

FIG.8

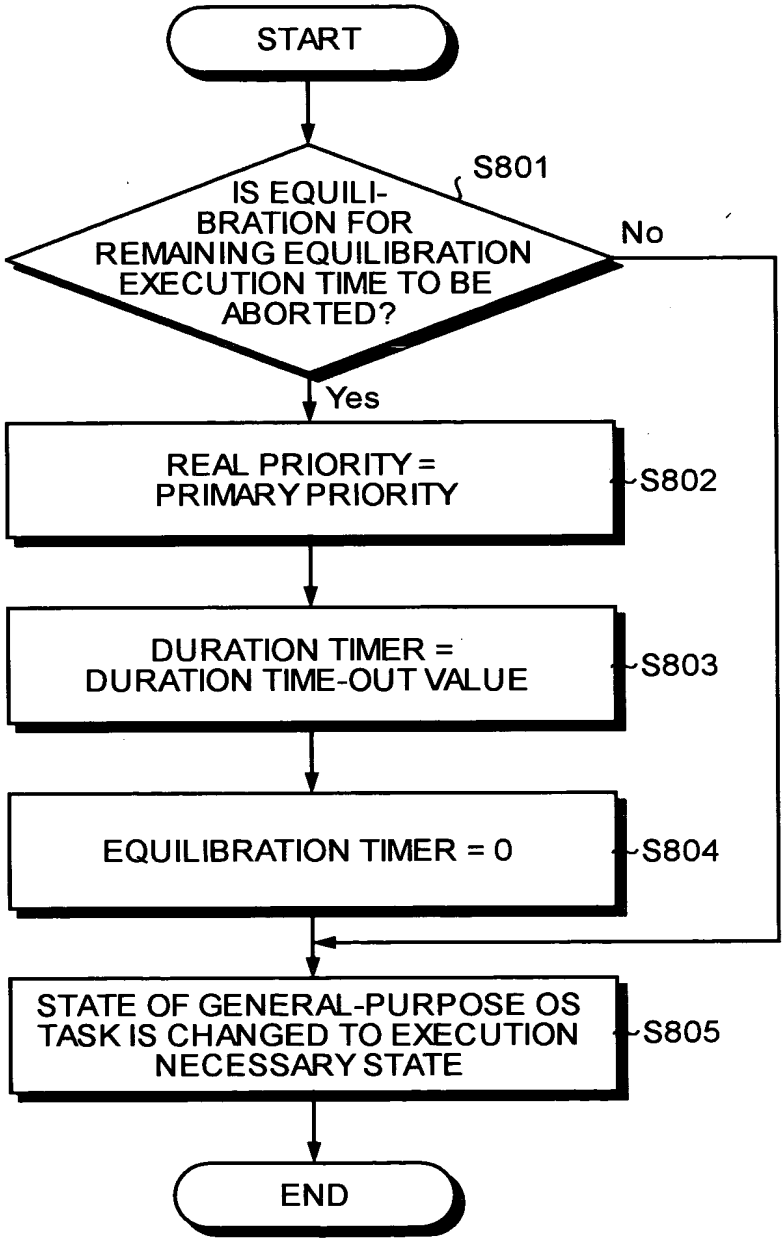

START
S801
IS EQUILI-BRATION FOR REMAINING EQUILIBRATION EXECUTION TIME TO BE ABORTED?
No
Yes
REAL PRIORITY = PRIMARY PRIORITY
S802
DURATION TIMER = DURATION TIME-OUT VALUE
S803
EQUILIBRATION TIMER = 0
S804
STATE OF GENERAL-PURPOSE OS TASK IS CHANGED TO EXECUTION NECESSARY STATE
S805
END

FIG.9

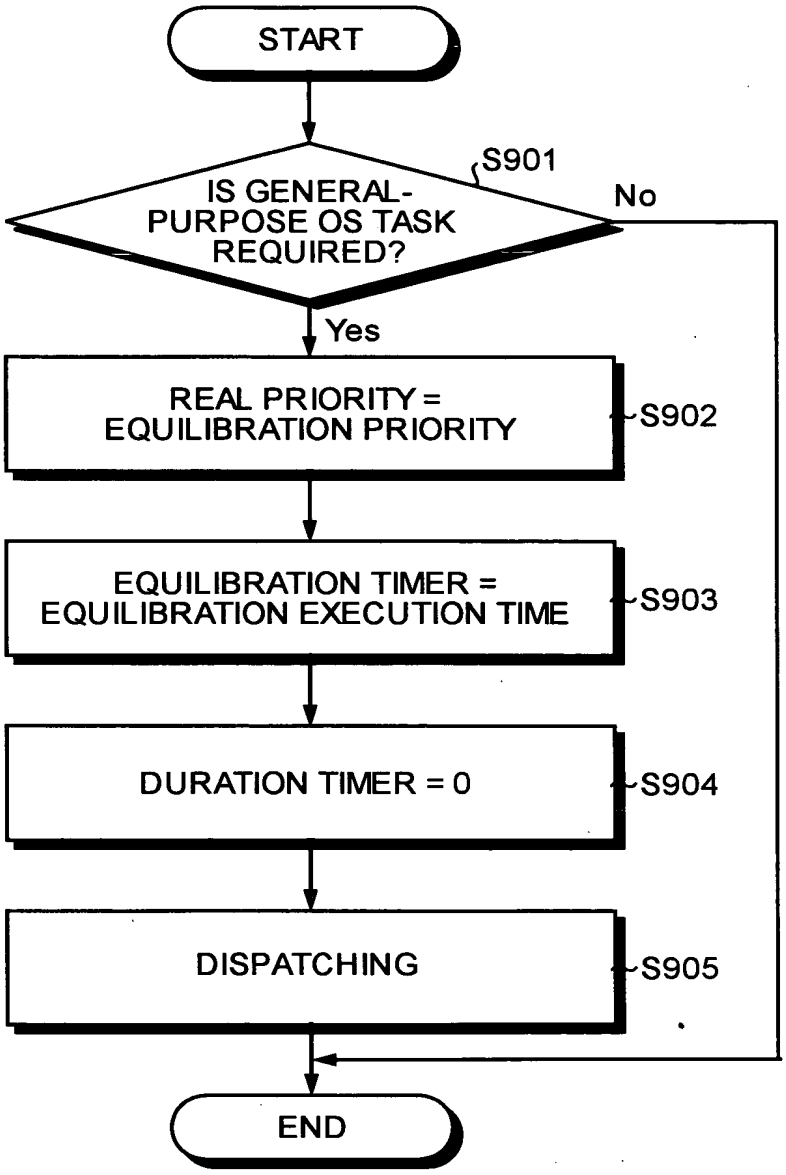
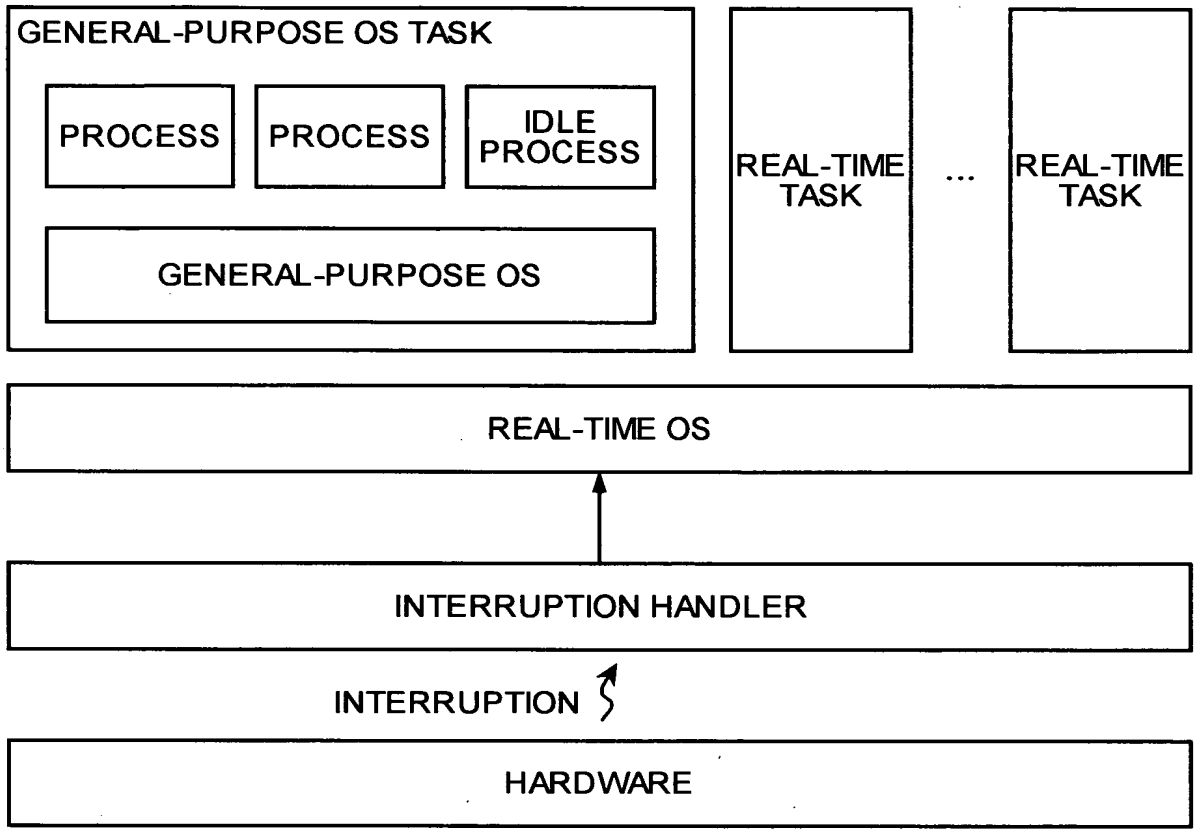

START
S901
IS GENERAL-PURPOSE OS TASK REQUIRED?
No
Yes
REAL PRIORITY = EQUILIBRATION PRIORITY
S902
EQUILIBRATION TIMER = EQUILIBRATION EXECUTION TIME
S903
DURATION TIMER = 0
S904
DISPATCHING
S905
END

FIG.10

STATE TRANSITION OF GENERAL-PURPOSE OS TASK, AND OPERATION RELATED TO REAL-TIME OS FOR EQUILIBRATION										
	STATE									
EVENT/ CONDITION	S1		S1		S3		S4		S5	
	INITIAL		EXECUTION IS NECESSARY (PRIMARY PRIORITY)		EXECUTION IS NECESSARY (EQUILIBRATION PRIORITY)		EXECUTION		IDLE	
	TRANSI-TION DESTI-NATION	OPERATION	TRANSI-TION DESTI-NATION	OPERATION	TRANSI-TION DESTI-NATION	OPERATION	TRANSI-TION DESTI-NATION	OPERATION	TRANSI-TION DESTI-NATION	OPERATION
E1: TASK GENERATION	S2	• REAL PRIORITY = PRIMARY PRIORITY • DURATION TIMER = DURATION TIME-OUT VALUE, START DURATION TIMER	–	–	–	–	–	–	–	–
E2: TIMER INTERRUPTION	–	–	S2	DURATION TIMER-1	–	–	S4	IF EQUILIBRATION IS BEING EXECUT-ED, EQUILIBRATION TIMER - 1	–	–
E3: DURATION TIMER == 0	–	–	S3	• REAL PRIORITY = EQUILIBRATION PRIORITY • EQUILIBRATION TIMER = EQUILI-BRATION EXECU-TION TIME	–	–	–	–	–	–
E4: TASK SWITCHING	–	–	S4	STOP DURATION TIMER	S4	OPERATE EQUILIBRATION TIMER	S2	• REAL PRIORITY = PRIMARY PRIORITY • DURATION TIMER = DURATION TIME-OUT VALUE, START DURATION TIMER	–	–
E5: EQUILIBRATION TIMER == 0	–	–	–	–	–	–	S2	• REAL PRIORITY = PRIMARY PRIORITY • DISPATCHING	–	–
E6: RESOURCE WAITING	–	–	–	–	–	–	S5	• REAL PRIORITY = PRIMARY PRIORITY • STOP EQUILIBRA-TION TIMER	–	–
E7: CANCELLATION OF RESOURCE WAITING	–	–	–	–	–	–	–	–	S2	DURATION TIMER = DURATION TIME-OUT VALUE, START DURATION TIMER
E8: EQUILIBRATION REQUEST SYSTEM CALL	–	–	S3	• REAL PRIORITY = EQUILIBRATION PRIORITY • EQUILIBRATION TIMER=EQUILI-BRATION EXECU-TION TIME	–	–	–	–	–	–

FIG.11


GENERAL-PURPOSE OS TASK
PROCESS
PROCESS
IDLE PROCESS
GENERAL-PURPOSE OS
REAL-TIME TASK
...
REAL-TIME TASK
REAL-TIME OS
INTERRUPTION HANDLER
INTERRUPTION
HARDWARE